UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,953	07/25/2006	Makoto Iida	128832	3409

25944 7590 10/28/2009

OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER	
RAO, G NAGESH	
ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
10/28/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/586,953	IIDA ET AL.	
	Examiner	Art Unit	
	G. NAGESH RAO	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *28-79* is/are pending in the application.

4a) Of the above claim(s) *28-48, 75-76, and 79* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *49-74 and 77-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/25/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1) Claims 28-48, 75-76, and 79 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 7/10/09.

Applicant's election with traverse of claims 49-74 and 77-78 in the reply filed on 7/10/09 is acknowledged. The traversal is on the ground(s) that the various claimed inventions share a technical feature. This is not found persuasive because:

A) The X references (JP 03-080193 and JP 11-116392) cited on the search report was relied upon which describe that the impurities, including Cu are drawn off. Specifically, section 0026 describes that samples taken indicate that impurity levels are below detection as demonstrated in Table 1 of section 0025. As the levels are below the minimum level of detection, it would be safe to indicate that there are no precipitates and then the onus becomes Applicants to show otherwise.

B) Regarding the argument that the claims are inseparable due to the relationship linking them, claim 28 (independent product claim) refers to a single Si crystal with no Cu precipitates and claim 78 refers to void defects which are not

even mentioned in either the apparatus or the method claims. Therefore these characteristics are not cited as specific in the method so there is no clear indication that the apparatus and method are specific only to make the product claimed. Additionally, there is no indication that the apparatus is specifically designed for carrying out the process. In this case the apparatus is a furnace. That's it. There is *no specific design* attributed to the apparatus for carrying out the process limitations claimed or the product with the claimed characteristics.

Based upon the X references which shows that the claims do not provide a contribution over the art, and the reasoning above that there is no "special adaptation" between the product, process, and apparatus, the finding of lack of unity is proper.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2) Claims 49-72 are objected to because of the following informalities: The claims depend from withdrawn non-elected claims and therefore must be amended to reflect their separate status from the withdrawn claimed inventions. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3) Claims 49-72 and 77 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims depend from withdrawn non-elected claims and therefore must be amended to reflect their separate status from the withdrawn claimed inventions. Appropriate correction is required.

Examiner suggests applicants amend the claims to reflect an independent format starting with the method claim preamble. Since the current reading of the claim denotes two statutory classes of inventions attempting be claimed in the same flow, starting with apparatus then transitioning with method, rather then denoting two separate endeavors.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4) Claims 49-72 and 77 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The incorporation of the

claimed invention as being apparatus and then as method in the same context of the preambles of the respective claimed inventions when interpreted by examiner provides conflict as to the scope of what is the invention's statutory subject matter?

Method Claims Embodied with Apparatus Claims

5) Upon review of the claimed invention, it is the examiner's position that the claims are directed towards a method and therefore will be treated in accordance to examination of "method claims". Furthermore the material worked upon or used in the system is viewed as a recitation of intended use on part of the actual device components and therefore will not be afforded any patentable limitation weight towards the structure of the device. For further details examiner points to MPEP 2114 [R-1].

Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive

in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

6) Claims 53-54 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 51-52. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7) Claims 49-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakurada (US Pg Pub 2003/0116082).

Sakurada 082 pertains to a method of fabricating a Silicon single crystal via an apparatus (see Abstract and Figure 2). Furthermore as denoted by Figure 1, a defect region therein contains a Nv region outside an OSF ring over the entire region in the direction of the crystal growth axis.

8) Claims 49-50, 55-64, and 74 are rejected under 35 U.S.C. 102(b) as being anticipated by Oda (US Pg Pub 2003/0000457).

Oda 457 discloses among many things a clean room at a class 1000 setting that allows for the growth, processing, and manufacturing of Silicon single crystal material made via a Cz growth technique (See Abstract, Section 0003, Sections 0040-0042). Furthermore Oda 457 makes no mention of the use of a Cu raw material being used in conjunction with the cleaning tools, jigs, etc used in the clean room which anticipates the claims denoted by applicant, as it is maintained in a class 1000 clean room environment (See Sections 0001-0043).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9) Claims 65-73 and 77-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda (US Pg Pub 2003/0000457) in view of Holder (US Patent No. 6,344,083).

As previously disclosed in the aforementioned rejection Oda 457 discloses a method of fabricating a Si single crystal material in a clean room class setting of 1000.

However Oda 457 fails to explicitly disclose the specified method as described by applicants for fabrication of the Si single crystal melt specifically time and energy power parameters.

In the same field of endeavor, Holder 083 clearly discloses a method for producing a silicon single crystal by Cz method which includes a melting and equilibrium phase of the raw material for 3.5 hrs and utilization of heaters at appropriate temperature settings as well flowing of insoluble (reads on inert) gases into the crystalline mix. Furthermore the quartz crucible material is not disclosed as having any Cu concentration and thus considered to void/free of said limitation (See Cols 1-6 Lines 1-69).

It would be obvious to one having ordinary skill in the art at the time of the present invention to modify the teachings of Oda 457 with that of Holder 083 to ensure an appropriate and defect free fabrication of Si single crystalline ingots for appropriate and efficient use in the microelectronic industry.

Furthermore the issue of the electric power setting, that is an resultant effective variable that is readily determined by operator's usage. It would be obvious to one having ordinary skill in the art at the time of the present invention to modify power settings based on desired results for achieving optimal conditions.

Routine experimentation would be readily feasible to one having ordinary skill in the art at the time of the present invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to G. NAGESH RAO whose telephone number is (571)272-2946. The examiner can normally be reached on 8:30AM-5PM (INDEPENDENT FLEX SCHEDULE).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael KORNAKOV can be reached on (571)272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. Nagesh Rao/
GAU-1792
Patent Examiner